

Patent claims

1. Gearbox device, comprising: two parallel tracks (30, 31; 61, 62), which are both arranged to be moveable; at least one planet wheel (9, 63), arranged between the two tracks (30, 31; 61, 62) and operatively connected at its perimeter with the two tracks (30, 31; 61, 62); a bearing axle (10, 67) moveable parallel to the two tracks and about which the planet wheel (63) is rotatably mounted; and a power transmission axle (12, 69), the arrangement being such that, as a result of the planet wheel (9, 63) rolling along the two tracks (30, 31; 61, 62), both movements of the power transmission axle (12, 69) can be transmitted to at least one of the moveably arranged tracks (30, 31; 61, 62) and conversely movements from at least one of the moveably arranged tracks (30, 31; 61, 62) can be transmitted to the power transmission axle (12, 69) and/or the respectively other moveably arranged track (30, 31; 61, 62), **characterised in that** the power transmission axle (12, 69) is arranged eccentrically at the bearing axle (10, 67) or a carrier element (6) for the planet wheel (9, 63) and is moveably guided on a track (30a, 70a) which extends parallel to and at a prescribed spacing from the two moveable tracks (30, 31; 61, 62).

30

2. Gearbox device according to claim 1, **characterised in that** the bearing axle (10, 67) has a diameter which is from 0.5 - 1 times the value of the diameter of the planet wheel (9, 63), and **in that** the planet wheel (9, 63) is designed as a ring

35

which is rotatably mounted on the bearing axle (10, 67).

3. Gearbox device according to one of claims 1 or 2,
5 **characterised in that** the eccentric position of the power transmission axle (12, 69) is variable.
4. Gearbox device according to one of claims 1 to 3,
10 **characterised in that** it is in the form of a planetary gear system.
5. Gearbox device according to claim 4, **characterised in that** the one moveably arranged track is formed by the outer perimeter of a sun wheel (1) and the
15 other moveably arranged track is formed by the inner perimeter of a ring gear (2) of the planetary gear system.
6. Gearbox device according to claim 4 or 5,
20 **characterised in that** the bearing axle (10) is fastened to a planet carrier (6, 26) which is mounted to rotate about the central axis (4) of the planetary gear system.
- 25 7. Gearbox device according to one of claims 4 to 6, **characterised in that** the power transmission axle (12) is configured as a journal projecting from the bearing axle (10) and is coupled to a connecting lever (38) which sits on a drive shaft
30 (39) mounted so as to rotate about the central axis (4) of the planetary gear system.
8. Gearbox device according to one of claims 4 to 6,
35 **characterised in that** the power transmission axle is in the form of a journal (42) projecting from

the bearing axle (10) and is coupled to a connecting rod (43) of a crank mechanism.

- 5 9. Gearbox device according to one of claims 4 to 8,
characterised in that the ring gear (2) on the
outer perimeter is in the form of a driving or
driven member.
- 10 10. Gearbox device according to one of claims 4 to 9,
characterised in that it contains two planetary
gear systems which are coupled to one another, one
of these systems being set up to drive one of the
two tracks of the other planetary gear system.
- 15 11. Gearbox device according to claim 10,
characterised in that the sun wheels (1, 21) of
the two planetary gear systems are securely inter-
connected, the sun wheel (21) of a first planetary
gear system being driven via the ring gear (22) of
20 the first planetary gear system, which ring gear
is driven by the second planetary gear system, and
thus driving the sun wheel (1) of the second
planetary gear system.
- 25 12. Gearbox device according to claim 10 or 11,
characterised in that the eccentric power axles
(12, 24) of the two gear systems are arranged with
their planet wheels (9, 23) lying offset by 180°
behind one another or opposite one another.
- 30 13. Gearbox device according to one of claims 10 to
12, **characterised in that** the point of the action
of force (radius on the gear system) at the power
axle (12) with lever arm and journal (28, 29) at
35 the planet wheel (9) of the first gear system is
identical to the two operative connections of

planet wheel (9, 23) and ring gear (2, 22) (broken line 30).

- 5 14. Gearbox device according to one of claims 10 to 13, **characterised in that** the central axis of the power axle (25) of the second gear system and its radius are identical to the operative connection of the planet wheel (9) and the sun wheel (1) of the first gear system (broken line 31, 34).
- 10 15. Gearbox device according to one of the preceding claims, **characterised in that** the power axle (12) in a crank mechanism is arranged offset by 180° on the carrier element (6).
- 15 16. Gearbox device according to one of the preceding claims, **characterised in that** the power axle (42) at the bearing axle (10) in a crank mechanism is arranged on the opposite side of the operative connection sun wheel/planet wheel and the main drive (high speed, low power) then takes place at the sun wheel (1).
- 20 17. Gearbox device according to one of claims 10 to 16, **characterised in that** the bearing axle (25) of the planet wheel (23) of the first gear system is arranged to be optionally fixed or rotatable, or is held fixed in place.
- 25 18. Gearbox according to one of claims 1 to 3, **characterised in that** the two tracks (61, 62) are designed linear or arcuate.
- 30 19. Gearbox device according to claim 18, **characterised in that** it contains a rod-shaped guiding element (70), mounted so as to be
- 35

displaceable parallel to tracks (61, 62) and coupled to the bearing axle (67) in the region of the power transmission axle (69).

- 5 20. Gearbox device according to claim 18 or 19,
 characterised in that, in order to avoid undesired
 lever actions between the guiding element (70) and
 the power transmission axle (69), said guiding
10 element is mounted in bearings (71), the effective
 lines (70a) of which lie substantially in the same
 plane as the power transmission axle (69).
21. Gearbox device according to one of claims 18 to
 20, **characterised in that** it contains at least one
15 driving or driven gear (72, 86) which is in
 operative connection with a side of one of the
 moveable tracks (62), this side being remote from
 the planet wheel (63).
- 20 22. Gearbox device according to one of claims 18 to
 21, **characterised in that** the tracks (61, 62) are
 configured as racks, chains, cables or roller
 surfaces.
- 25 23. Gearbox device according to one of claims 18 to
 22, **characterised in that** one of the tracks (62)
 drives a lift or at least a driven gear (72).
24. Gearbox device according to one of claims 1 to 23,
30 **characterised in that** the carrier element (6)
 comprises a ring, an arm or a disc.
25. Gearbox device according to one of claims 10 to
 14, **characterised in that** the power transmission
35 axle (25) of the second gear system is connected

via a U-shaped arm (32) to a shaft (B1) which is coaxial with the gearbox axis (4).

26. Gearbox device according to one of claims 10 to 14
5 and 24, 25, **characterised in that** the power transmission axle (25) is arranged to be rotatable or fixed, or is held fixed in place.